

# Notice of Allowability

Application No.

09/739,952

Examiner

Truc T. Chuong

Applicant(s)

REKIMOTO, JUNICHI

Art Unit

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## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed 11/16/05.
2. ☒ The allowed claim(s) is/are 1-13, 15-28 and 30-35.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
  - \* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

- |   |   |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)           |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                   |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|   | 9. <input type="checkbox"/> Other _____   |

### DETAILED ACTION

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in the telephone interview with Attorney Mr. Thomas C. Basso on February 6, 2006. In this communication, claims 1, 22, 23, 26-28, and 30-35 have been amended, and claims 14 and 29 are cancelled.

2. The claims have been amended as follows:

Claim 1 (currently amended): An information input/output system to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said system comprising:

one or more than one operation surfaces arranged in said information space;

a display means for displaying an image on said operation surfaces;

an imaging means for picking up an image of said operation surfaces;

a stationary environment type computer arranged in said information space; and

one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, said visual marker including identification information and position information for said physical objects;

said environment type computer being adapted to execute;

a processing operation of recognizing the identification information and the position information of each of said physical objects by identifying the visual marker on the surface of each of said physical objects;

a processing operation of recognizing ~~the~~ a digital object dropped to a site on the surface of each of said physical objects; and

a processing operation of forming link information for linking the digital object to the dropped site on the surface for each of said physical objects.

Claim 2 (original): The information input/output system according to claim 1, wherein at least one of said physical objects is a portable computer capable of being moved in said information space and exchanging digital objects with other computers.

Claim 3 (original): The information input/output system according to claim 1, wherein at least one of said physical objects is a portable computer capable of being moved in said information space and exchanging digital objects with other computers; and

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said environment type computer can expand a mouse/cursor operation on the installed portable computer onto said operation surfaces.

Claim 4 (original): The information input/output system according to claim 1, wherein

said imaging means can identify the position indicated by an optical pointer for indicating a specific position by irradiating a beam of light with a predetermined wavelength; and

the user is allowed to indicate a position in said information space by means of coordinates and the optical pointer.

Claim 5 (original): The information input/output system according to claim 1, wherein said environment type computer executes a processing operation of calling the linked digital object and/or displaying the digital object to the user in response to a user operation applied to the site of forming the link information on the surface of each of the physical objects on the basis of the image picked up by said imaging means.

Claim 6 (previously presented): An information input/output system to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said system comprising:

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one or more than one operation surfaces arranged in said information space;

a display means for displaying an image on said operation surfaces;

an imaging means for picking up an image of said operation surfaces;

a stationary environment type computer arranged in said information space;

one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, said visual marker including identification information and position information for said physical objects; and

a portable ID recognition device adapted to recognize/identify the visual marker on the surface of each of said physical objects.

Claim 7 (previously presented): The information input/output system according to claim 6, wherein

said environment type computer is adapted to execute;

a processing operation of receiving the identification information of the source object and that of the destination object from said ID recognition device; and

a processing operation of applying an action specified on the basis of the combination of the type of the source object and that of the destination object.

Claim 8 (original): The information input/output system according to claim 6, wherein  
  
at least one of said physical objects is a portable computer capable of being moved in said information space and exchanging digital objects with other computers.

Claim 9 (previously presented): An information input/output system to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said system comprising:

one or more than one operation surfaces arranged in said information space;

a display means for displaying an image on said operation surfaces;

an imaging means for picking up an image of said operation surfaces;

a stationary environment type computer arranged in said information space; and

one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, said visual marker including identification information and position information for said physical objects;

at least one of said physical objects being a virtual camera having a virtual imaging direction as specified by the position information contained in the visual marker.

Claim 10 (previously presented): The information input/output system according to claim 9, wherein

said environment type computer is adapted to execute;

a processing operation of recognizing/identifying said virtual camera and identifying the position information and the virtual imaging direction;

a processing operation of generating a virtual picked up image according to the position information and the virtual imaging direction; and a processing operation of displaying the virtual picked up image to the user.

Claim 11 (original): The information input/output system according to claim 9, wherein at least one of said physical objects is a portable computer that can move in said information space and exchange digital objects with another computer.

Claim 12 (previously presented): An information input/output system to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said system comprising:

one or more than one operation surfaces arranged in said information space;

a display means for displaying an image on said operation surfaces;

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an imaging means for picking up an image of said operation surfaces;

a stationary environment type computer arranged in said information space;

one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, said visual marker including identification information and position information for said physical objects; and

an optical pointer adapted to point to a specific position by irradiating a beam of light with a predetermined wavelength, wherein said imaging means is capable of identifying the position pointed to by said optical pointer.

Claim 13 (original): The information input/output system according to claim 12, wherein said environment type computer executes on the basis of the image picked up by said imaging means;

a processing operation of recognizing the user operation on said operation surfaces, using said optical pointer; and

a processing operation of controlling the display of the digital object by said display means according to the result of the recognition.

Claim 14 (canceled).



Claim 15 (previously presented): An information input/output system to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said system comprising:

one or more than one operation surfaces arranged in said information space;

a display means for displaying an image on said operation surfaces;

an imaging means for picking up an image of said operation surfaces;

a stationary environment type computer arranged in said information space;

one or more than one portable computers capable of exchanging digital objects with other computers;

one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, said visual marker including identification information and position information for said physical objects; and

a portable ID recognition device adapted to recognize the visual marker on the surface of each of said physical objects and being capable of holding or releasing the recognized identification information.

Claim 16 (original): The information input/output system according to claim 15, wherein said environment type computer executes;

a processing operation of obtaining a digital object corresponding to the held identification information in response to the holding operation of said ID recognition device; and

a processing operation of transferring a digital object corresponding to the held identification information to a nearby physical object in response to the releasing operation of said ID recognition device.

Claim 17 (previously presented): An information input/output system to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said system comprising:

one or more than one operation surfaces arranged in said information space;

a display means for displaying an image on said operation surfaces;

an imaging means for picking up an image of said operation surfaces;

a stationary environment type computer arranged in said information space;

one or more than one portable computers capable of exchanging digital objects with other computers; and

one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, said visual marker including identification information and position information for said physical objects;

said environment type computer being adapted to allow mouse/cursor operations on said portable computers to extend to said operation surfaces and display a rubber band as visual feedback according to the area on said operation surfaces defined by means of said mouse/cursor.

Claim 18 (original): The information input/output system according to claim 17, wherein said environment type computer is adapted to pick up an image of the area defined by the rubber band by means of said imaging means and take the picked up image in said information space as digital object.

Claim 19 (original): The information input/output system according to claim 17, wherein another object can apply a process or a method it possesses to the rubber-banded original digital object in response to an action of said original object of being dropped on said another object.

Claim 20 (original): The information input/output system according to claim 19, wherein said another object is a physical object possessing a process or a method for printing a document.

Claim 21 (original): The information input/output system according to claim 19, wherein said another object is a name card possessing a process or a method for mailing a document to the mail address corresponding to the name on it.

Claim 22 (currently amended): An information input/output method system to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said method comprising:

providing an information input/output system information space having one or more than one operation surfaces arranged in said information space, a display means for displaying an image on said operation surfaces, an imaging means for picking up an image of said operation surfaces, a stationary environment type computer in said information space and one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, said visual marker including identification information and position information for said physical objects ~~said system comprising~~;

a step of firstly recognizing the identification information and the position information of each of said physical objects from the visual marker included on the surface of each of said physical objects;

a step of secondly recognizing the digital object dropped to a site on the surface of each of said physical objects; and

a step of forming link information for linking the digital object to the dropped site on the surface for each of said physical objects.

Claim 23 (currently amended): The information input/output ~~system-method~~ according to claim 22, wherein

at least one of said physical objects is a portable computer capable of being moved in said information space and exchanging digital objects with other computers; and

said environment type computer can expand a mouse/cursor operation on the installed portable computer onto said operation surfaces in said second recognition step.

Claim 24 (currently amended): The information input/output ~~system-method~~ according to claim 22, wherein said imaging means can identify the position indicated by an optical pointer for indicating a specific position by irradiating a beam of light with a predetermined wavelength; and

the user is allowed to indicate a position in said information space by means of coordinates and the optical pointer.

Claim 25 (currently amended): The information input/output ~~system~~ method according to claim 22, further comprising:

a step of calling the linked digital object and/or displaying the digital object to the user in response to a user operation applied to the site of forming the link information on the surface of each of the physical objects.

Claim 26 (currently amended): An information input/output ~~method~~ system to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said method comprising:

providing an information input/output system having one or more than one operation surfaces arranged in said information space, a display means for displaying an image on said operation surfaces, an imaging means for picking up an image of said operation surfaces, a stationary environment type computer arranged in said information space, one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, where the visual marker includes identification information and position information for the physical objects; and a portable ID recognition device adapted to recognize/identify the visual marker on the surface of each of said physical objects; ~~said system~~ comprising;

a step of receiving the identification information of the source object and that of the destination object from said ID recognition device; and

a step of applying an action specified on the basis of the combination of the type of the source object and that of the destination object.

Claim 27 (currently amended): An information input/output method system to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said method comprising:

providing an information input/output system having one or more than one operation surfaces arranged in said information space, a display means for displaying an image on said operation surfaces, an imaging means for picking up an image of said operation surfaces, a stationary environment type computer in said information space and one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, where the visual marker includes identification information and position information for the physical objects, at least one of said physical objects being a virtual camera having a virtual imaging direction as specified by the position information contained in the visual marker, ~~said system comprising~~;

a step of recognizing/identifying said virtual camera and identifying the position information and the virtual imaging direction;

a step of generating a virtual picked up image according to the position information and the virtual imaging direction; and

a step of displaying the virtual picked up image to the user.

Claim 28 (currently amended): An information input/output method system to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said method comprising:

providing an information input/output system having one or more than one operation surfaces arranged in said information space, a display means for displaying an image on said operation surfaces, an imaging means for picking up an image of said operation surfaces, a stationary environment type computer arranged in said information space, one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, where the visual marker includes identification information and position information for the physical objects, and an optical pointer adapted to point a specific position by irradiating a beam of light with a predetermined wavelength, said imaging means being capable of identifying the position pointed by said optical pointer, ~~said system comprising~~;

a step of recognizing the user operation on said operation surfaces, using said optical pointer; and

a step of controlling the display of the digital object by said display means according to the result of the recognition.

Claim 29 (canceled).



Claim 30 (currently amended): An information input/output method system to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said method comprising:

providing an information input/output system having one or more than one operation surfaces arranged in said information space, a display means for displaying an image on said operation surfaces, an imaging means for picking up an image of said operation surfaces, a stationary environment type computer arranged in said information space and one or more than one portable computers capable of exchanging digital objects with other computers, one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, where the visual marker includes identification information and position information for the physical objects, and a portable ID recognition device adapted to recognize the visual marker on the surface of each of said physical objects and being capable of holding or releasing the recognized identification information, ~~said system comprising:~~

a step of obtaining a digital object corresponding to the held identification information in response to the holding operation of said ID recognition device; and

a step of transferring a digital object corresponding to the held identification information to a nearby physical object in response to the releasing operation of said ID recognition device.

Claim 31 (currently amended): An information input/output ~~method system~~ to be used for user operations relating to an object in an information space realized by expanding a digital space of a computer into the real world, said ~~method comprising~~:

~~providing an information input/output system~~ having one or more than one operation surfaces arranged in said information space, a display means for displaying an image on said operation surfaces, an imaging means for picking up an image of said operation surfaces, a stationary environment type computer arranged in said information space, one or more than one portable computers capable of exchanging digital objects with other computers and one or more than one physical objects mounted on said operation surfaces and containing a visually identifiable visual marker on the surface thereof, where the visual marker includes identification information and position information for the physical objects; ~~said system comprising~~;

a step of allowing mouse/cursor operations on said portable computers to extend to said operation surfaces; and

a step of displaying a rubber band as visual feedback according to the scope on said operation surfaces as defined by means of said mouse/cursor.

Claim 32 (currently amended): The information input/output ~~method system~~ according to claim 31, further comprising:

a step of picking up an image of the scope defined by the rubber band by means of said imaging means and taking the picked up image in said information space as digital object.

Claim 33 (currently amended): The information input/output ~~system~~method according to claim 31, further comprising:

a step of applying a process or a method possessed by said another object to the rubber-banded original digital object in response to an action of said original object of being dropped on said another object.

Claim 34 (currently amended): The information input/output ~~system~~method according to claim 33, wherein said another object is a physical object possessing a process or a method for printing a document.

Claim 35 (currently amended): The information input/output ~~system~~method according to claim 33, wherein said another object is name card possessing a process or a method for mailing a document to the mail address corresponding to the name on it.

***Allowable Subject Matter***

3. Claims 1-13, 15-28, and 30-35 are allowed.
4. The following is an examiner's statement of reasons for allowance in combination with other claim limitations:

Independent claims 1, 6, 9, 12, 15, 17, 22, 26, 27, 28, and 30-31, when considered as a whole, are allowable over the Prior Art of record. Specifically, the Prior Art of

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record fails to teach that using the device/visual marker to pick up one or more physical objects in the information space, wherein the physical objects mounted on the operation surfaces and containing the visually identifiable visual marker on the surface thereof the visual marker including identification information and position information the physical objects, the processing operation of recognizing the digital object dropped to the site on the surface of each of the physical objects and forming link information for linking the digital object to the dropped site on the surface for each the physical objects.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Truc T. Chuong whose telephone number is 571-272-4134. The examiner can normally be reached on M-Th and alternate Fridays 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Weilun Lo can be reached on (571) 272-4847. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Truc T. Chuong

02/06/06



**WEILUN LO**  
**SUPERVISORY PATENT EXAMINER**